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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,033	09/02/2003	Shuichi Takeuchi	P23802	1531
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DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/652,033

Applicant(s)

TAKEUCHI ET AL.

Examiner

Alicia M Harrington

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2003 and 17 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 12, 13 and 15-19 is/are rejected.
- 7) ☒ Claim(s) 6-11, 14, 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1203.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The Examiner has considered the information disclosure statement filed on 12/17/03.

Claim Objections

2. Claims 2-11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 2 is broader than claim 1 from which it depends. For example claim 2 recites the first outer area give the beam passing through said at least first outer area a first phase difference relative to the beam passing through the central area. Claim 1 recites the beam after passing through said at least one first outer area will be in a first phase state which does not include a state where the beam has no phase difference relative to a beam passing through said central area (i.e. a first phase difference) Claim 2 also recites a second outer area gives the beam passing through said at least one second outer area a second phase difference. Claim 1 also recites the beam after passing through said at least one second outer area will be a second phase state which is different from said first phase state and includes a state where the beam has no phase difference relative to the beam passing through said central area (i.e. a second phase difference). Therefore, the first outer area and the second outer area have a phase difference relative the central area as already defined by claim 1; and claim 2 fails to further limit claim 1 from which it depends. Claims 3-11 inherit their objection from claim 2 from which they depend.

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3. Claims 17-20 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 17 is broader than claim 16 from which it depends. For example claim 17 recites the first outer area give the beam passing through said at least first outer area a first phase difference relative to the beam passing through the central area. Claim 16 recites the beam after passing through said at least one first outer area will be in a first phase state which does not include a state where the beam has no phase difference relative to a beam passing through said central area (i.e. a first phase difference) Claim 17 also recites a second outer area gives the beam passing through said at least one second outer area a second phase difference. Claim 16 also recites the beam after passing through said at least one second outer area will be a second phase state which is different from said first phase state and includes a state where the beam has no phase difference relative to the beam passing through said central area (i.e. a second phase difference). Therefore, the first outer area and the second outer area have a phase difference relative the central area as already defined by claim 16; and claim 17 fails to further limit claim 16 from which it depends. Claims 18-20 inherit their objection from claim 17 from which they depend.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed.

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Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-4,12,13,15,16,17-19 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,3,16,17,18 and 19, of copending Application No. 10/721,908. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Regarding claim 1 (application 10/652,033) recites a scanning optical system for dynamically deflecting a laser beam emitted from a light source by a deflecting system, converging the dynamically deflected laser beam by an imaging optical system into a spot beam on a scan target surface, and thereby scanning the spot beam in a main scanning direction on said scan target surface comprising. (Claim 1 of application 10/721,908 recites a substantially equivalent preamble in lines 1-6.)

an optical element being placed on an optical path between said light source and said deflecting system, said optical element including (see claim 1, lines 7-10 of application 10/721,908; the optical element of claim 1 of 10/652,033 reads on the collimator lens in so far as a collimator is an optical element and it inherently has a front and rear surface):

a central area transmitting part of the laser beam in the vicinity of a central axis of the laser beam (see claim 1, lines 11-12 of application 10/721,908);

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at least one first outer area transmitting part of the laser beam incident on part of said optical element outside said central area while having an effect on the laser beam so that the beam after passing through said at least one first outer area will be in a first phase state which does not include a state where the beam has no phase difference relative to a beam passing through said central area (see claim 1, lines 13-20 of application 10/721,908) and

at least one second outer area transmitting part of the laser beam incident on part of said optical element other than said central area and said at least one first outer area while having an effect on the laser beam so that the beam after passing through said at least one second outer area will be in a second phase state which is different from the said first phase state and includes a state where the beam has no phase difference relative to the beam passing through the said central area (see claim 1, lines 21-30 of application 10/721,908).

Regarding claim 2, the scanning optical system of claim 1, wherein said at least one first outer area gives the beam passing through said at least one first outer area a first phase difference relative to the beam passing through said central area (see claim 1, lines 13-20 of application 10/721,908), and

wherein said at least one second outer area gives the beam passing through said at least one second outer area a second phase difference relative to the beam passing through said central area (see claim 1, lines 21-30 of application 10/721,908).

Regarding claim 3, the scanning optical system of claim 2, wherein the first phase difference is set to θ that satisfies a condition:

$$\cos\theta < \theta \quad (1) \text{ (see lines 2-4 of claim 3/2 of 10/721,908)}$$

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wherein the second phase state is set to θ that satisfies a condition

$$0.9 < \cos \theta \quad (2) \text{ (see lines 2-4 of claim 3 of 10/721,908).}$$

Regarding claim 4, the scanning optical system according to claim 3, where the first phase difference is set substantially equal to $(2n-1)\pi$ (rad) ((N: integer)- see lines 5-7 of claim 3/2 of application 10/721,908; for example if $N=1$, then 3π is less than 10π) and where the second phase difference is set substantially equal to $2M\pi$ (rad) ((M: integer)- see lines 5-8 of claim 3 of application 10/721,908; for example if $M=1$, then 2π is less than 10π).

Regarding claim 12, the scanning optical system of according to claims 1, wherein the optical element further includes a shading part as an aperture stop (see lines 2-3 of claim 16 of application 10/721,908), and

wherein said at least one first outer area and said at least one second outer area are placed in an aperture of said shading part (see lines 4-6 of claim 16 of application 10/721,908).

Regarding claim 13, the scanning optical system according to claim 1, wherein said at least one first outer area and said at least one second outer area are arranged on both sides of said central area along said main scanning direction in order in which said at least one first outer area is arranged inside at least one second outer area (see claim 17, lines 1-7 of application 10/721,908).

Regarding claim 15, the scanning optical system according to claim 1, wherein said imaging optical system includes a reflecting surface (see claim 18, lines 1-2 of application 10/721,908).

Regarding claim 16, a printer having a scanning optical system for dynamically deflecting a laser beam emitted from a light source by a deflecting system, converging

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the dynamically deflected laser beam by an imaging optical system into a spot beam on a scan target surface, and thereby scanning the spot beam in a main scanning direction on said scan target surface, said scanning optical system including (see lines 1-9 of claim 19 of application 10/721,908):

an optical element being placed on an optical path between said light source and said deflecting system (see claim 19, lines 9-12; the optical element of claim 16 of 10/652,033 reads on the collimator lens in so far as a collimator is an optical element and it inherently has a front and rear surface), said optical element including:

a central area transmitting part of the laser beam in the vicinity of a central axis of the laser beam (see lines 13-24 of claim 19 of application 10/721,908);

at least one first outer area transmitting part of the laser beam incident on part of said optical element outside said central area while having an effect on the laser beam so that the beam after passing through said at least one first outer area will be in first phase state which doesn't which does not include a state where the beam has no phase difference relative to a beam passing through said central area (see lines 14-21 of claim 19 of application 10/721,908); and

at least one second outer area transmitting part of the laser beam incident on part of said optical element other than said central area and said at least one first outer area while having an effect on the laser beam so that the beam after passing through said at least one second outer area will be in a second phase state which is different from said first phase state and includes a state where the beam has no phase difference relative to the beam passing through said central area (see lines 22- 31 of claim 19 of application 10/721,908).

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Regarding claim 17, the printer according to claim 16, wherein said at least one first outer area gives the beam passing through said at least one first outer area a first phase difference relative to the beam passing through said central area (see lines 14-21 of claim 19 of application 10/721,908), and wherein at least one second outer area gives the beam passing through said at least one second outer area gives the beam passing through said at least one second outer area a second phase difference relative to the beam passing through said central area (see lines 22-31 of claim 19 of application 10/721,908).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claim 5 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of copending Application No. 10/721,908 in view of (US 5,477,554) Yoshii et al. Regarding claim 5, application 10/721,908 fails to specifically disclose the at least one first outer area is formed to circumscribe said central area.

In the same field of endeavor, Yoshii teaches a phase shifting element in an optical scanning system where the phase shifting element has areas that circumscribe each other. The example illustrates an outer area (24) circumscribing a central area (22) that represents a phase shift (see col. 8, lines 19-29) element. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify application 10/721,908 as taught by Yoshii, since such structural design is known in the prior art and provides a device easily manufactured, as taught by Yoshii.

This is a provisional obviousness-type double patenting rejection.

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7. Claims 16-19 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 3 of copending Application No. 10/721,908 in view of (US 5,477,554) Yoshii et al.

Regarding claim 16, a printer having a scanning optical system for dynamically deflecting a laser beam emitted from a light source by a deflecting system, converging the dynamically deflected laser beam by an imaging optical system into a spot beam on a scan target surface, and thereby scanning the spot beam in a main scanning direction on said scan target surface, said scanning optical system including (see lines 1-6 of claim 1 of application 10/721,908):

an optical element being placed on an optical path between said light source and said deflecting system (see claim 1, lines 7-10; the optical element of claim 16 of 10/652,033 reads on the collimator lens in so far as a collimator is an optical element and it inherently has a front and rear surface), said optical element including:

a central area transmitting part of the laser beam in the vicinity of a central axis of the laser beam (see lines 11-12 of claim 1 of application 10/721,908);

at least one first outer area transmitting part of the laser beam incident on part of said optical element outside said central area while having an effect on the laser beam so that the beam after passing through said at least one first outer area will be in first phase state which doesn't which does not include a state where the beam has no phase difference relative to a beam passing through said central area (see lines 13-20 of claim 1 of application 10/721,908); and

at least one second outer area transmitting part of the laser beam incident on part of said optical element other than said central area and said at least one first outer area while

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having an effect on the laser beam so that the beam after passing through said at least one second outer area will be in a second phase state which is different from said first phase state and includes a state where the beam has no phase difference relative to the beam passing through said central area (see lines 21- 30 of claim 1 of application 10/721,908). However, application 10/721,908 fails to specifically disclose in claim 1, the scanning optical system is a printer scanning optical system.

In the same field of endeavor, Yoshii discloses a scanning optical system for deflecting a laser beam emitted from a light source by a deflecting system, converging the deflected beam by an imaging optical system into a spot beam on a scan target surface, and thereby scanning the spot beam in a main scanning direction on a scan target surface including an optical phase element is implemented in a printer laser scanner optical system (see col. 13, lines 1-5 and for example figure 12). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify 10/721,908 as taught by Yoshii, to include the laser scanning optical system in a printer scanning optical system, since it is well known in the prior art and such a scanning system helps to correct for astigmatism.

Regarding claim 17, the printer according to claim 16, wherein said at least one first outer area gives the beam passing through said at least one first outer area a first phase difference relative to the beam passing through said central area (see lines 13-20 of claim 1 of application 10/721,908), and wherein at least one second outer area gives the beam passing through said at least one second outer area gives the beam passing through said at least one second outer area a

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second phase difference relative to the beam passing through said central area (see lines 21-30 of claim 1 of application 10/721,908).

Regarding claim 18, the printer scanning optical system of claim 17, wherein the first phase difference is set to θ that satisfies a condition:

$$\cos\theta < 0 \quad (1) \text{ (see lines 2-4 of claim 3/2 of 10/721,908)}$$

wherein the second phase state is set to 0 that satisfies a condition

$$0.9 < \cos\theta \quad (2) \text{ (see lines 2-4 of claim 3 of 10/721,908).}$$

Regarding claim 19, the printer scanning optical system according to claim 18, where the first phase difference is set substantially equal to $(2n-1)\pi$ (rad) ((N: integer)- see lines 5-7 of claim 3/2 of application 10/721,908; for example if N= 1, then 3π is less than 10π) and where the second phase difference is set substantially equal to $2M\pi$ (rad) ((M: integer)- see lines 5-8 of claim 3 of application 10/721,908; for example if M= 1, then 2π is less than 10π).

Allowable Subject Matter

8. Claims 6-11,14,20 would be allowable if rewritten to overcome the rejection(s) under provisional double patenting and/or objections, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M Harrington whose telephone number is 571 272 2330. The examiner can normally be reached on Monday - Thursday 9:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571 272 2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



AMH

Alicia M Harrington
Examiner
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